

## 102.3 - Copper Base Alloys (chip and rod forms)

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

SRM	158a	458	459	460	871	872	874	875	880
Description	Silicon Bronze	Beryllium-Copper (17510)	Beryllium-Copper (17200)	Beryllium-Copper Alloy	Phosphor Bronze (CDA 521)	Phosphor Bronze (CDA 544)	Cupro-Nickel, 10% (CDA 706) "HIGH-PURITY"	Cupro-Nickel, 10% (CDA 706) "DOPED"	Nickel Silver (CDA 770)
Unit of Issue	(150 g)	(50 g)	(50 g)	(50 g)	(100 g)	(100 g)	(100 g)	(100 g)	(100 g)

Concentration are expressed as mass fraction, in % (unless noted by an asterisk \* for mg/kg).

Aluminum (Al)	0.46	0.030	0.044	0.048					
Antimony (Sb)		(<0.005)	(<0.005)	(<0.005)			< 0.001	< 0.001	
Arsenic (As)							(<0.0006)	(0.0010)	
Beryllium (Be)		0.360	1.82						
Bismuth (Bi)							<0.0002	0.003	
Cadmium (Cd)							<0.0002	0.0022	
Carbon (C)							(0.0023)	(0.0035)	
Chromium (Cr)		0.004	0.005	0.005					
Cobalt (Co)		0.076	0.221						
Copper (Cu)	90.93	(97.9)	(97.7)	(97.5)	91.68	87.36	88.49	87.83	54.51
Gold (Au)									
Hydrogen (H)							(0.0016)	(0.004)	
Iron (Fe)	1.23	0.060	0.079	0.098	<0.001	0.003	1.22	1.45	0.004
Lead (Pb)	0.097	0.002	0.001	0.258	0.010	4.13	<0.0005	0.0092	0.002
Magnesium (Mg)		0.003	0.007				(0.0002)	(0.0010)	

Concentration are expressed as mass fraction, in % (unless noted by an asterisk \* for mg/kg).

Manganese (Mn)	1.11	(<0.002)	(<0.003)	(<0.003)			0.0020	<0.0007	<0.001
Nickel (Ni)	0.001	1.60	0.039	0.031			10.18	10.42	18.13
Oxygen (O)							(0.06)	(0.14)	
Phosphorus (P)	0.026				0.082	0.26	0.002	0.0020	
Selenium (Se)							0.00015	0.0004	
Silicon (Si)	3.03	0.035	0.077	0.77			(0.0006)	(0.0008)	
Silver (Ag)		(<0.01)	(<0.003)	(<0.002)					
Sulfur (S)		(<0.002)	(<0.001)				(0.0011)	(0.0011)	
Tellurium (Te)								(<0.0001)	
Tin (Sn)	0.96	0.004	0.005	0.006	8.14	4.16	0.007	0.009	

All values in % unless otherwise indicated

\*Value is in mg/kg.

- Certified values are normal font
- Reference values are italicized
- Values in parentheses are for information only

102.3 - Copper Base Alloys (chip and rod forms)

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

1034	1035
Unalloyed Copper	Leaded-Tin Bronze Alloy
(rod)	(50 g)
( <i>&lt;2</i> ) <sup>*</sup>	
(0.2) <sup>*</sup>	
(0.2) <sup>*</sup>	
(0.2) <sup>*</sup>	
(0.2) <sup>*</sup>	
( <i>&lt;1</i> ) <sup>*</sup>	
(0.3) <sup>*</sup>	
(0.2) <sup>*</sup>	
(99.96)	(78.5)
( <i>&lt;0.05</i> ) <sup>*</sup>	
(2.0) <sup>*</sup>	(0.001)
(0.5) <sup>*</sup>	(13.5)
( <i>&lt;1</i> ) <sup>*</sup>	
( <i>&lt; 0.1</i> ) <sup>*</sup>	
(0.6) <sup>*</sup>	(0.75)
(363) <sup>*</sup>	(0.64)
	(0.004)
(3.3) <sup>*</sup>	
( <i>&lt;2</i> ) <sup>*</sup>	
(8.1) <sup>*</sup>	
2.8 <sup>*</sup>	22.3 <sup>*</sup>
(0.5) <sup>*</sup>	
( <i>&lt;0.2</i> ) <sup>*</sup>	(6.8)

All values in % unless otherwise indicated  
\*Value is in mg/kg.

- Certified values are normal font
- Reference values are italicized
- Values in parentheses are for information only

### 102.3 - Copper Base Alloys (chip and rod forms)

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

<b>Titanium (Ti)</b>		( <i>&lt;0.002</i> )	( <i>&lt; 0.003</i> )				(0.0001)	( <i>&lt;0.0002</i> )	
<b>Zinc (Zn)</b>	2.08	0.002	0.002	0.004	0.025	4.0	0.002	0.11	27.3
<b>Zirconium (Zr)</b>		( <i>&lt;0.002</i> )	( <i>&lt;0.002</i> )						

All values in % unless otherwise indicated

\*Value is in mg/kg.

- Certified values are normal font
- Reference values are italicized
- Values in parentheses are for information only

102.3 - Copper Base Alloys (chip and rod forms)

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

( <i>&lt;11</i> ) <sup>*</sup>	(0.25)
--------------------------------	--------

All values in % unless otherwise indicated  
\*Value is in mg/kg.

- Certified values are normal font
- Reference values are italicized
- Values in parentheses are for information only